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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/904,200	07/11/2001	Christopher S. Chen	56252	1223
21874	7590	12/14/2006	EXAMINER	
EDWARDS & ANGELL, LLP			NAFF, DAVID M	
P.O. BOX 55874			ART UNIT	
BOSTON, MA 02205			PAPER NUMBER	
			1657	

DATE MAILED: 12/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	09/904,200		CHEN ET AL.	
	Examiner		Art Unit	
	David M. Naff		1657	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 64-68, 70-80, 83-92, 94 and 95 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 64-68, 70-80, 83-92, 94 and 95 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

An amendment of 9/28/06 in response to an office action of 3/28/06 amended claims 64 and 95.

Claims examined on the merits are 64-68, 70-80, 83-92, 94 and 95,
5 which are all claims in the application.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

Claims 64-68, 70-80, 83-92, 94 and 95 are rejected under 35
10 U.S.C. 103(a) as being unpatentable over Singhvi et al (6,368,838 B1) in view of Dewez et al (WO 96/15223) and Anderson et al (6,686,184 B1) for reasons in the previous office action of 3/28/06 and for reasons herein.

The claims are drawn to a device containing a substrate
15 comprising a polymeric surface having thereon a plurality of cytophilic regions that can adhere biomolecules and cytophobic regions to which the biomolecules do not adhere, and the cytophobic regions contain a surfactant compound adsorbed on the polymeric surface. The polymeric surface may comprises microfluidic channels.

20 Singhvi et al disclose a device having cytophilic islands for adhering cells and cytophobic regions which isolate the cytophilic islands. The cytophilic islands may contain extracellular matrix proteins (col 9, lines 32-33) to promote binding of cells (col 9, lines 22-26).

25 Dewez et al disclose a biomaterial for selective adhesion of cells or tissue which contains a polymeric support having a

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heterogeneous surface conditioned with a surfactant and an extracellular matrix protein. The extracellular matrix protein adheres to one surface area of the support and the surfactant adheres to another surface area where it inhibits adsorption of the extracellular matrix protein (paragraph bridging pages 3 and 4). Cells preferentially adhere to the portion of the support containing the extracellular matrix protein (page 4, lines 12-16).

Anderson et al disclose patterning surfaces using a stamp containing microfluidic channels.

It would have been obvious to provide the cytophilic islands of the device of Singhvi et al with extracellular matrix protein to enhance the binding of cells as suggested by Singhvi et al and Dewez et al, and it would have been obvious to provide the cytophobic regions of Singhvi et al with a surfactant to inhibit binding of extracellular matrix protein to these regions as suggested by Dewez et al. It would have been further obvious to provide the device of Singhvi et al with microfluidic channels to obtain the function of these channels in patterning a surface as disclosed by Anderson et al since the device of Singhvi et al can be used for patterning a surface as shown by Figure 1. The conditions of dependent claims would have been matters of obvious choice within the skill of the art in view of the disclosures of the references. The surfactant of Dewez et al can be a polyethylene oxide (page 19, 5). Selecting another known surfactant that provides the same function would have been obvious. The devices of Singhvi et al and Dewez et al can have various forms and shapes and to provide channels as claimed by claims 81 and 82 would have been obvious. As to claims 91 and 92, the surface of

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Singhvi et al can be made of plastic or polysulfone compounds (col 8, lines 44-45). Polysulfones are hydrophobic. Selecting other polymers that provide the same function would have been obvious.

Response to Arguments

Applicant's arguments filed 9/28/06 have been fully considered but they are not persuasive.

The amendment urges that Singhvi et al fail to teach a polymeric surface, cytophobic regions formed of surfactant compounds and microfluidic channels on the polymeric surface. However, Singhvi et al disclose that the surface can be formed of a plastic or polymer (col 8, lines 44-50). The claims do not exclude a self-assembled monolayer (SAM) on the surface, and the present specification discloses (page 8, lines 28-30, and page 15, lines 8-15) that SAMs can be used to form the cytophilic and cytophobic regions. The present specification discloses that there is no criticality in the surface material, and the surface material can be organic or inorganic and lists inorganic and polymer materials (paragraph bridging pages 17 and 18). It would have been obvious to adsorb a surfactant on a cytophobic SAM or substitute a hydrophobic surfactant for the SAM to prevent extracellular matrix protein from adsorbing on the surface in a similar way that Dewez et al adsorb a surfactant on a hydrophobic surface. Moreover, it would have been obvious to use a surfactant to form a cytophobic SAM since Dewez et al disclose (page 5, lines 16-19) that the surfactant can contain a polyethylene oxide group and Singhvi

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et al disclose that a biophobic SAM can contain a polyethylene glycol group (col 9, line 60). As to microfluidic channels, it would have been obvious to provide the channels on the surface to obtain the function of the channels as obtained by Anderson et al. The rejection is not based on Singhvi et al alone but on Singhvi et al in combination with Dewez et al and Anderson et al. Since the references are applied in combination, the references disclosing different methods does not make the rejection untenable. The present invention is merely a combination of prior art techniques where each is functioning as would be expected from the teachings of references applied. An unexpected result is not seen in the presently claimed modification of Singhvi et al.

The amendment urges that there is no motivation to modify the cytophobic region of Singhvi et al with a surfactant since the region is already cytophobic. However, when using an extracellular matrix protein for binding cells as disclosed by Dewez et al, one would have been motivated to use a surfactant to inhibit binding of the extracellular matrix protein to certain regions to which cells are to be adsorbed. The present specification discloses that extracellular matrix protein can be used for an adhesive to bind cells. For example, see page 9, lines 1-5, and page 13, lines 29-30.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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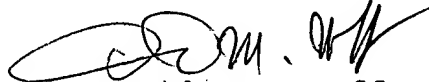
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David M. Naff whose telephone number is 571-272-0920. The examiner can normally be reached on Monday-Friday 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jon Weber can be reached on 571-272-0925. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



David M. Naff
Primary Examiner
Art Unit 1657

DMN

15 12/9/06